IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
AT CHARLESTON

IN RE ETHICON, INC., PELVIC REPAIR SYSTEM PRODUCTS LIABILITY LITIGATION	**Master File No. 2:12-MD-02327** **MDL 2327** **JOSEPH R. GOODWIN** **U.S. DISTRICT JUDGE**
THIS DOCUMENT RELATES TO: **WAVE 5 CASES**	

DEFENDANTS' MEMORANDUM OF LAW IN SUPPORT OF MOTION TO EXCLUDE THE OPINIONS AND TESTIMONY OF SCOTT A. GUELCHER, PH.D.

Defendants Ethicon, Inc. and Johnson & Johnson (collectively, "Ethicon") submit this memorandum in support of their motion to exclude the opinions and testimony of Scott A. Guelcher, Ph.D. The focus of this motion is a paper published by Guelcher and others which, in large part, seeks to revive tests and opinions already excluded by this Court. This motion applies to the cases listed in Ex. A.

INTRODUCTION

Guelcher's central opinion is that chemicals present in the human body—reactive oxidative species ("ROS")—react with and deplete the antioxidants used in Prolene, causing the Prolene to oxidize and degrade over time. *See* Ex. B, Expert Report of Scott A. Guelcher, Ph.D. ("Report") at 3.

Guelcher and others recently published an article (Ex. C, Talley, *et al.*, "Oxidation and degradation of polypropylene transvaginal mesh," J. Biomater. Sci., Polymer Ed. (2017) ("Talley")) on which he relies for the opinion that [polypropylene] mesh oxidizes and "degrades *in vitro*," and that explanted polypropylene mesh oxidized in the human body. Ex. B, Guelcher Report ("Report") at 11-12. But Talley is replete with methodological flaws that render the

testing it contains—and all of Guelcher's opinions based on it—unreliable. Indeed most of this testing has already been excluded once by this Court.

Ethicon also moves to exclude Guelcher's opinions concerning (1) the claim that alleged degradation of Prolene causes medical complications, as well as device malfunction and failure, (2) proposed alternative designs, and (3) Ethicon's state of mind, all of which are based on prior rulings of the Court. Ethicon requests a hearing on this Motion.

ARGUMENT

I. Legal Standard

Ethicon incorporates by reference the standard of review for *Daubert* motions as articulated in *Edwards v. Ethicon, Inc.*, 2014 WL 3361923, at **1-3, (S.D. W. Va. July 8, 2014).

II. The Court Should Exclude Guelcher's Degradation Opinions As Unreliable.

As the Fourth Circuit has explained, a "plaintiff may not prevail in a products liability case by relying on the opinion of an expert unsupported by any evidence such as test data or relevant literature in the field." *Nease v. Ford Motor Co.*, 848 F.3d 219, 231 (4th Cir. 2017). Here, Guelcher's degradation opinions are unreliable because (i) the testing on which he bases his opinions is riddled with methodological flaws, and (ii) he failed to support these opinions with relevant scientific literature.[1]

A. Guelcher's degradation opinions are not supported by reliable testing.

[1] Ethicon anticipates that Plaintiffs will argue that Talley is reliable because it was published. Indeed, at deposition, Guelcher repeatedly deflected questions regarding the testing by pointing to the fact that the article was peer-reviewed. *See, e.g.*, Ex. D, Guelcher 8/17/17 Dep. 61:10-22; 62:5-16; 63:24-64:17. But while peer-review is an important factor to consider in a *Daubert* inquiry, it is not dispositive. Indeed, numerous courts have excluded peer-reviewed literature and related opinions based on errors found during discovery. *See, e.g., In re Viagra Prods. Liab. Litig.*, 658 F. Supp. 2d 936, 939-40 (D. Minn. 2009); *Cedillo v. Sec'y of Health & Human Servs.*, No. 98-916V, 2009 WL 331968 (Fed. Cl. Feb. 12, 2009); *In re Silicone Gel Breast Implant Prod. Liab. Litig.*, (MDL 926), 1996 WL 34401766, at *1 (N.D. Ala. Oct. 31, 1996).

Guelcher has conceded that (1) Prolene is different from other polypropylene due to its additives, including antioxidants, s*ee, e.g.*, Ex. E, *Huskey v. Ethicon, Inc.*, 8/25/14 Trial Tr. 156:14-18; 157:11-17,[2] (2) that antioxidants retard degradation in polypropylene, s*ee, e.g.*, Ex. E, *Huskey v. Ethicon, Inc.*, 8/25/14 Trial Tr. 175:14-16, 176:8-21, (3) that he developed his initial opinions in this litigation without conducting any tests on Prolene, *id.* at 170:19-171:4, and (4) that he could not identify any peer-reviewed study showing that Prolene loses its antioxidants, *id.* at 178:6-11.

Recognizing these failings, Guelcher worked with Dr. Russell Dunn in trying to prove that Prolene is susceptible to oxidation. *See* Ex. I, Guelcher 12/18/14 Dep. 107:24-108:12. Guelcher and Dunn intentionally oxidized samples of generic polypropylene, one TVT, and two meshes made by another company using an oxidative medium that purportedly "recapitulated" *in vivo* conditions. *Id.* at 109:3-113:11. They analyzed the samples using Fourier transform infrared spectroscopy ("FTIR"), scanning electron microscopy ("SEM"), and X-ray photoelectron spectroscopy ("XPS"). *Id.* at 131:12-15. According to Guelcher, the test proved that Prolene "can oxidize and degrade under oxidative conditions similar to those experienced in the human body after implantation." *Id.* at 123:25-124:8.

More than two years ago, the Court found most of this testing to be unreliable because, among other things, Guelcher and Dunn failed to follow a written protocol or use a sufficient sample size. *See, e.g., Mathison v. Boston Sci. Corp*., No. 2:13-cv-05851, 2015 WL 2124991, at

[2] Ethicon recognizes that the Court has disagreed with its position that Prolene's composition renders it distinct from other forms of polypropylene. Ethicon respectfully submits that even Plaintiffs' experts have conceded that Prolene is unique. *See, e.g.*, Ex. E, *Huskey* 8/25/2014 Trial Tr. 156:14–18; 157:11–17 (Guelcher admitting that "Prolene is defined by the additives that are added to the polypropylene"); Ex. F, Guelcher 3/23/16 Dep. 87:23-88:9; Ex. G, Mays 3/2/16 Dep. 30:9-24 (Dr. Mays admitting that "Prolene is a particular formulation of polypropylene."); Ex. H, Priddy 3/8/16 Dep. 103:21-104:5 (Dr. Priddy conceding that Prolene is not identical to polypropylene).

*22 (S.D. W. Va. May 6, 2015). Following this ruling, Guelcher stopped relying on this testing. Ex. J, Guelcher 9/15/15 Dep. 82:23-83:20.

Recently, Guelcher collaborated with Dunn—as well as Drs. Anne Talley, Bridget Rogers, and Vladimir Iakovlev—in an attempt to breathe new life into the excluded testing by repackaging the data into the Talley article. Once again, Guelcher concluded that the testing proves that polypropylene, including Prolene, oxidizes under "simulated *in vivo* conditions." Ex. C, Talley at 3, 10-11.

The authors also conducted separate XPS tests of two sets of fibers from an explanted AMS mesh to determine whether polypropylene oxidizes in the human body. *Id.* at 1; Ex. D, Guelcher 8/17/17 Dep. 13:4-11. One set of fibers had not been treated, while the other set was mechanically scraped in an effort to remove an outer layer of tissues and proteins. Ex. C, Talley at 3, 5; *see also id.* at Supplemental Data ("Supp.") 1. They did not conduct any tests on explanted Ethicon Prolene mesh.

According to Guelcher, this testing (i) showed that polypropylene oxidizes *in vitro* and *in vivo*, and (ii) rebutted scientific literature showing that the presence of carbonyl groups, which Plaintiffs' experts claim are proof of oxidation, are actually evidence of proteins adhered to the surface of explanted mesh fibers. *Id.* at 3, 11-12; Ex. B, Report at 11-12.

At deposition, Guelcher repeatedly could not answer questions about the testing because it was actually conducted by his co-authors. *See, e.g.*, Ex. D, Guelcher 8/17/17 Dep. 44:2-18; 44:25-48:17; 60:4-61:1; 62:5-63:1.[3] He also did not produce as required the raw data on which the study relied, even though he could get the data if he tried. *Id.* at 17:9-20:8.[4]

[3] Guelcher explained Dunn conducted the FTIR and SEM, Dr. Rogers performed the XPS, and Dr. Iakovlev prepared the explanted mesh sample. *Id.* at 15:22-16:3.

[4] Guelcher had produced some limited data related to this testing at an earlier deposition. However, he made no effort to gather all of the data underlying the Talley article for production at his deposition.

Despite Guelcher's attempts to hide behind his co-authors and unproduced data, he now seeks to inform the jury that "[he has] shown that PP mesh oxidizes and degrades *in vitro*," and that the explanted AMS polypropylene mesh oxidized in the human body. Ex. B, Report at 11-12. The Court should once again preclude Guelcher for offering these unreliable opinions.

1. The intentional oxidation testing is rife with methodological flaws.

a. The intentional oxidation testing is merely a repackaged version of testing previously excluded as unreliable.

This Court previously excluded this intentional oxidation testing because of a lack of qualifications of the person conducting the tests and because the authors "failed to follow a written protocol or utilize a sufficiently large sample size." *Mathison*, 2015 WL 2124991, at *22. At deposition, Guelcher admitted that Talley "did not repeat the experiment." The authors merely "did more work on the analysis to basically present the paper in a form that could be published." Ex. D, Guelcher 8/17/17 Dep. 71:6-72:9.

Because the authors did not actually conduct the experiment again to address the errors identified by the Court in *Mathison*, those errors persist in the current iteration of the test. Talley simply recycled the data from a test already found to be unreliable by this Court, and the testing should be excluded on the same grounds.

b. Talley failed to validate the use of their oxidative medium.

In Talley, the authors attempted to intentionally oxidize polypropylene samples using an oxidative medium composed of 20% hydrogen peroxide and 0.1 M cobalt chloride that purportedly "recapitulates the oxidative microenvironment between an adherent macrophage and the PP surface." Ex. C, Talley at 3. However, nothing in Talley or Guelcher's report establishes that the oxidative medium actually replicates the conditions in the human body. Absent some reliable validation, the Court should exclude Guelcher's opinions as unreliable. *See Nease*, 848

F.3d at 232 (expert who "presented a hypothesis only—[and] failed to validate it with testing" warranted exclusion). This point is even more damning given the failure to justify or even acknowledge that Talley used a 20% hydrogen peroxide solution while the Zhao study on which Talley relies used only a 10% hydrogen peroxide solution. Ex. K, Q.H. Zhao, "Human plasma macroglobulin promotes *in vitro* oxidative stress cracking of Pellethane 2363-80A: *In vivo* and *in vitro* correlations," 27 J. Biomed. Mater. Res. 379-89 at 380 (1993).

Also, Zhao analyzed the effects of this oxidative medium on polyurethane, not polypropylene or Prolene. Ex. C, Talley at 3 n.18, 22; *see also* Ex. B, Report at 11 & n. 33. Zhao validated his 10% oxidative medium (not 20%) for polyurethane testing by using SEM images to compare the surface features of polyurethane samples exposed to the oxidative medium to samples explanted from the human body. In other words, Zhao used the oxidative medium only to replicate the *results* of exposing polyurethane samples to *in vivo* conditions—it has not been shown to replicate the actual *in vivo* conditions themselves.

Furthermore, Talley actually tends to disprove the claim that the oxidative medium replicates *in vivo* conditions with respect to polypropylene. Talley examined the surface of the fibers using SEM before and after exposure to the supersized oxidative medium, and reported flaking, peeling, and pitting. Ex. C, Talley at 9. But the flaking, peeling, and pitting in these samples is inconsistent with the surface of other explanted polypropylene fibers. *Id.* at 12-13.[5] By producing completely different effects on the surface of the fibers, the authors showed that an oxidative medium twice the concentration of the predicate test protocol replicates neither *in vivo* conditions nor the effects of such conditions as to polypropylene.

[5] Scientific literature has shown that the transverse cracking concerns only an outer layer of biological material, not the fiber itself. *See* Ex. L, R. de Tayrac, et al., "Basic science and clinical aspects of mesh infection in pelvic floor reconstructive surgery," 22 Int. Urogynecol. J. 775-80 (2011); Ex. M, K. Ong, et al., "The myth: *in vivo* degradation of polypropylene-based meshes," 27 Int. Urogynecol. J. S37-S38 (2016).

Talley sought to explain these morphological differences by claiming that "mechanical stress" is necessary to produce the transverse cracking seen on explanted polypropylene. Ex. C, Talley at 12. But the authors did not conduct any testing to substantiate this speculation, even though Guelcher admitted at deposition that such testing could have been done. Ex. D, Guelcher 8/17/17 Dep. 84:6-20.

c. Guelcher's conclusions based on FTIR analysis are not the product of a reliable methodology.

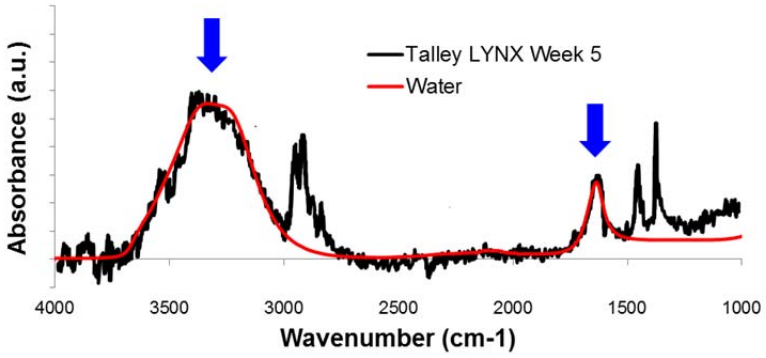
Talley claims that the intentional oxidation testing of TVT and Boston Scientific mesh proves that polypropylene oxidizes under simulated *in vivo* conditions. Ex. C, Talley at 6. Using only a partial FTIR spectra, the authors calculated the "peak area" for carbonyl and hydroxyl groups based on the area under the FTIR curve between ranges purportedly associated with those groups to "confirm our hypothesis that PP mesh oxidizes in response to ROS, such as hydroxyl radicals." *Id.* However, Talley does not provide the complete FTIR data, and Guelcher refused to provide the underlying data at deposition.[6] Guelcher was unable to explain at deposition why the article does not provide the complete FTIR spectra. Ex. D, Guelcher 8/17/17 Dep. 63:2-19.[7]

Ethicon's experts have shown that the peaks in the FTIR spectra on which Guelcher relies for his opinions are likely due, not to oxidation, but to water on the surface of the fibers—either from incomplete drying during sample preparation or water vapor from the ambient air. *See* Ex. N, Wave 5 Expert Report of Dr. Steven MacLean at 45-46; Ex. O, Wave 5 Expert Report of Dr.

[6] Talley also erred by misidentifying the FTIR range at which evidence of polypropylene oxidation supposedly appears, and repeatedly conflates the FTIR signatures associated with carbonyls and hydroxyl groups in their article.

[7] Guelcher was unable to discuss the FTIR scans in any detail. Guelcher could not quantify the number of FTIR scans taken each week, Ex. D, Guelcher 8/17/17 Dep. 58:7-11, and could not say how many are appropriate for this kind of test (*id.* at 58:12-59:11). Likewise, he could not explain variances in the FTIR spectra without looking at the raw data. He deferred all of these questions to Dunn (*id.* at 59:13-63:1).

Shelby Thames at 72-73. The IR spectrum of liquid water has peaks of nearly identical position and shape to those produced in the paper.



Ex. N, MacLean Report at 47 Fig. 5 (FTIR spectrum of deionized water overlay with authors' FTIR of Lynx mesh after 5 weeks of exposure); *see also* Ex. P, B. Mizaikoff, "Waveguide-enhanced mid-infrared chem/bio sensors," 42 Chem. Soc. Rev. 8683-99 (2013).

The scientific way to determine whether water is the confounding factor is to review the complete FTIR spectra. Guelcher did not produce these spectra at his deposition; he defers these issues to Dunn. Ex. D, Guelcher 8/17/17 Dep. 63:2-64:20.

2. The XPS analysis of explanted AMS mesh is unsound.

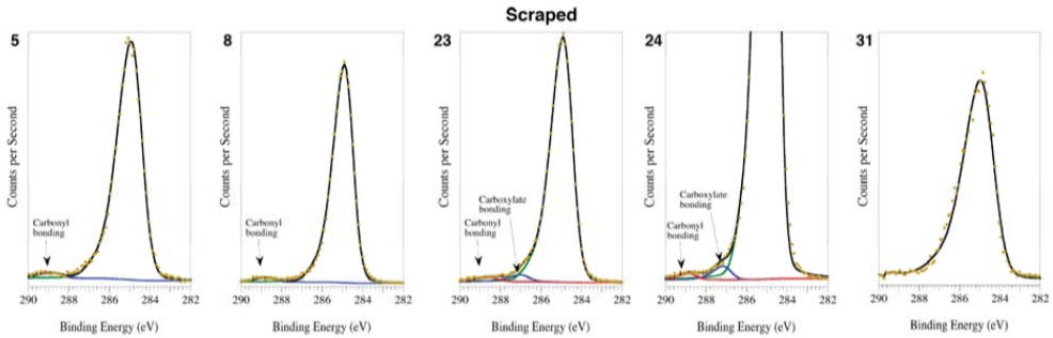
Guelcher and his co-authors conducted XPS on explanted AMS polypropylene mesh. Ex. C, Talley at 5. Talley tested (i) a set of five fibers that had been mechanically scraped by Iakovlev in an attempt to remove the outer layer of tissues and proteins; and (ii) a set of five "untreated" fibers, focusing on areas free from residual tissue/proteins and areas where such residue was present. *Id.*; *see also id.* at Supp. 1. The group conducted no analysis of explanted Ethicon mesh.

Pointing to XPS spectra of one unidentified scraped AMS fiber and one unidentified untreated AMS fiber, the authors conclude that the mesh oxidized *in vivo*. *See* Ex. C, Talley at 8 & 10, Fig. 4(D). The authors reproduced the XPS spectra for each of the ten fibers analyzed in

their Supplemental Data as Figure S2. *Id.* at 2. However, the Supplemental Data does not support and is inconsistent with the conclusions reached in Figure 4(E) and in the paper.

a. The explant testing is unreliable because the conclusions are based on data that do not appear in the test results.

Scrutiny of the explant testing demonstrates that the authors' conclusion is based on data that is not present in the XPS spectra. For example, the following is an excerpt from Figure S2, which contains the raw XPS spectra of scraped fibers:



Ex. C, Talley at Supp. 2. As the authors state in the text, "[t]wo Scraped fibers (numbers 5 and 8) showed some carbonyl type bonding, while Scraped fibers numbered 23 and 24 contain both carbonyl and carboxylate type bonding[,]" and number 31 showed neither bonding type present. *Id.* at Supp. 3-4. Thus, the authors acknowledge that XPS conducted on fibers 5 and 8 showed only carbonyl type bonding, and no carboxylate type bonding.

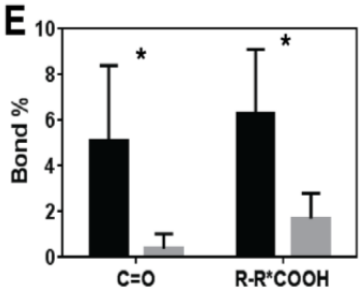
Table S6 (which purportedly incorporates the XPS data for scraped fibers depicted in Figure S2), shows data for fibers 5 and 8 under "287 eV R-C*COOH"—which represents carboxylate type bonding—even though none is present in the XPS spectra in Figure S2. *Id.* at Supp. 4 (third column). Specifically, Table S6 shows 2.5% carboxylate bonding on fiber 5, and 2.3% present on fiber 8: these data points do not appear on the XPS spectra for these fibers.

Table S6. Summary of relative amounts (%) of the various C 1s bonding configurations present on Scraped fibers.

Fiber #	≈288 eV C=O	≈287 eV R-C*COOH	≈284.8 eV -CH	≈284.3 eV
5	ND	2.5	97.5	ND
8	ND	2.3	97.7	0.6
23	1.5	2.6	95.9	1.0
24	0.4	1.2	98.4	0.2
31	ND	ND	100	0.0
Mean ± SD	0.4 ± 0.6	1.7 ± 1.1	0.1 ± 0.2	97.9 ± 1.5

Id. The authors incorporate these two data points, which are at the very least erroneous, in calculating a mean of 1.7% for carboxylate bonding, with a standard deviation of 1.1. *Id.* (bottom row of third column).

The authors used the flawed data they entered in Table S6—not the actual data from the actual XPS spectra—to create Figure 4(E), which depicts a mean of 1.7% for carboxylate bonding:



Id. at 10 Fig. 4(E). Finally, the authors state that Figure 4(E) "reveal[s] evidence of carbonyl and hydroperoxide peaks" on scraped and untreated fibers, which they claim is evidence of *in vivo* oxidation. *Id.* at 8;[8] Ex. D, Guelcher 8/17/17 Dep. 30:6-10.

The authors neither acknowledge nor explain the absence of the carboxylate bonding data points for fibers 5 and 8 that appear in Table S6. Yet, Figure 4(E)—which is the basis for the authors' conclusion that the fibers oxidized *in vivo*—incorporates these fictitious data points.

[8] The authors assert that Figure 4(D) also demonstrates that the fibers oxidized *in vivo* because it purportedly show that carbonyl and hydroperoxide peaks on scraped and untreated fibers. *Id.* at 10 Fig. 4(D). Tellingly, the authors chose not to create Figure 4(D) using the XPS spectra for fibers 5 or 8, which show that no carbonyls were present.

And Guelcher provided no explanation at deposition. Ex. D, Guelcher 8/17/17 Dep. 36:15-37:20. Nor could he determine the statistical impact of removing these data points. *Id.* at 37:7-10.[9]

b. The authors failed to follow a protocol for scraping explanted fibers.

Guelcher's opinions based on the Talley AMS explant testing are unreliable because the authors failed to identify a protocol for the scraping of explanted fibers. The failure to follow a testing protocol can render an expert's methodology unreliable. *Tyree v. Bos. Sci. Corp.*, 54 F. Supp. 3d 501, 536-37 (S.D. W. Va. 2014). This is because "[v]igorous adherence to protocols and controls are the hallmarks of 'good science.'" *Id.* at 537.

The only information Talley provides regarding the preparation of the scraped fibers is that "the outer layer was mechanically removed using tweezers and a scalpel blade under a dissection microscope." Ex. C, Talley at 5; Ex. D, Guelcher 8/17/17 Dep. 15:6-14 (conceding that he was unaware as to whether any protocol exists). But this description is not a protocol, and does not identify any objective criteria regarding the authors' methods. And Guelcher did not produce the underlying data, materials, lab notebooks or other information related to this physical scraping. Further, Guelcher testified in an earlier deposition that proteins adsorbed onto a mesh explant could not be mechanically removed. Ex. F, Guelcher 3/23/16 Dep. 136:4-13 ("Probably not…you could desorb them, you could break them with a proteinase. Yeah. Something not mechanical.").

The authors' failure to incorporate objective standards is striking given the scales of the materials. The outer layer of explanted fibers is 1-7 microns thick. *See, e.g.*, Ex. Q, Iakovlev 9/11/15 Dep. 93:18-94:13. The thickness of a human hair is 70-100 microns. *See, e.g.*, Ex. R,

[9] A review of the authors' work reveals a number of additional errors. For example, although the authors purportedly identify the relative amounts of bonding configurations on the fibers in Tables *see* Ex. C, Talley at S4-S6, the reported bonding configurations on several of the fibers exceed 100%. *See id.* at Supp. 4. In addition, in numerous instances, the authors' mean/standard deviation ratios show that the standard deviation exceeds the mean, which signifies that the data are scientifically invalid. *See id.*

Bellew 3/5/15 Trial Tr. 680:10-12. Yet, the authors claim that they removed a layer of biological material an order of magnitude thinner than a human hair, without affecting the allegedly oxidized surface, using only a hand-held scalpel and tweezers under a microscope.

The authors' failure to adhere to a protocol for preparing the scraped fibers shows that their methodology is unreliable. *See Mathison*, 2015 WL 2124991, at *22.

c. The conclusion that oxygen on scraped fibers is oxidation is speculation.

The authors' "attribut[ion]" of oxygen on the surface of scraped fibers to *in vivo* oxidation is the crux of their explant testing. *See* Ex. C, Talley at 8. The authors cited no authority for the proposition that the mere presence of oxygen on an explanted fiber proves that the fiber oxidized in the human body. Thus, the authors' conclusion is only valid if it is based on reliable scientific testing. *See Oglesby*, 190 F.3d at 249.

The Court is well-aware of the importance of controls in scientific testing. *See Tyree*, 54 F. Supp. 3d at 536-37; *see also* Mem. Op. and Order (*Daubert* Motion re: Vladimir Iakovlev), at 8-9 (S.D. W. Va. Sept. 1, 2016) [ECF # 2710]. And as the Fourth Circuit has recognized, an expert who fails to rule out plausible alternative explanations for his opinions is subject to exclusion. *See Oglesby*, 190 F.3d at 250.

The Talley testing is unreliable because they failed to conduct control tests to rule out alternative explanations for oxygen on the scraped fibers. For example, the authors did not run a control test using pristine AMS polypropylene to establish a baseline for their analysis. *See* Ex. D, Guelcher 8/17/17 Dep. 78:16-22. Without such a test, the authors could not determine if oxygen is expected in pristine AMS polypropylene. Guelcher admitted at deposition that he did not know why the authors did not run a control test, or whether they even discussed the issue. *Id.*

The authors simply made no effort to rule out the polypropylene itself as the source of the oxygen they observed.

The authors also failed to exclude the possibility that the oxygen was a constituent of other naturally occurring, oxygen-containing molecules found in the human body. For instance, the same ROS that Guelcher claims are responsible for the oxidation of polypropylene also contain oxygen. Similarly, fatty acid esters and cholesterols—both of which are known to contain oxygen—are abundant in the human body. In fact, fatty acid esters and cholesterol have been reported to adsorb onto the surface of polypropylene fibers. *See, e.g.*, Ex. S, P. Bracco, et al., "Comparison of polypropylene and polyethylene terephthalate (Dacron) meshes for abdominal wall hernia repair: a chemical and morphological study," 9 Hernia 52-55 (2005).

But, as discussed above, the authors' preparation of the scraped fibers was limited to "mechanical[] remov[al]" of the outer layer "using tweezers and a scalpel blade under a dissection microscope." Ex. C, Talley at 5. There is no indication that the authors used water, bleach, or enzymatic treatments to rinse, soak, or otherwise clean the fibers to remove any alternative sources of oxygen molecules. Nor is there any suggestion that they analyzed the fibers to confirm that any fatty acids, cholesterols, ROS, or any other potential sources of oxygen had been removed. As Guelcher conceded at deposition, there is nothing in their data that would permit him to rule out the possibility that the oxygen they found on the surface of the fibers was an ester or a cholesterol. *See* Ex. D, Guelcher 8/17/17 Dep. 77:20-78:15.

The authors failed to run any of a number of control tests to exclude alternative sources of oxygen. For this reason, the authors could not reliably establish that any oxygen they observed was evidence of oxidation. *See Oglesby*, 190 F.3d at 250.

d. Talley data show contamination of the testing.

The Talley XPS data shows that the test results were likely the result of contamination. In Tables S1-S3, the authors recorded the amounts of different atoms present on the fibers. Ex. C, Talley at Supp. 3. They reported that silicon was present on 9 of the 15 fibers. *Id.* The presence of silicon in the authors' test results casts substantial doubt on their methodology.

Silicon is not a constituent of normal human tissue. *See, e.g.,* Ex. T, Y. Kim, "Human Tissues: Chemical Composition and Photo Dosimetry Data," 57 Radiation Research 38-45 (1974). Nor is silicon likely to be an ingredient of polypropylene mesh.[10] Silicon is, however, a common laboratory contaminant. *See, e.g.,* B. Kanegsberg, *et al.*, "Silicon Contamination Part 1," https://www.cemag.us/article/2004/03/silicone-contamination-part-1 (2004). Silicon is a key ingredient of silicone greases and lubricants commonly used in the maintenance of laboratory instruments—including XPS. *Id.*

Despite detecting silicon on the explanted mesh fibers, the authors made no effort to determine its source or explain its presence. *See, e.g.,* Ex. D, Guelcher 8/17/17 Dep. 48:23-49:6.[11] Guelcher admitted that while the authors "suspected it's something from the manufacturing process," this was merely their "best guess." *Id.* They failed to run a control test using pristine AMS polypropylene, or determine its chemical composition, to rule out the mesh as the source. *Id.* at 50:2-11. When asked about contamination at deposition, Guelcher merely

[10] The wide variation of the silicon on the 9 fibers—from 0.2% to 3%—coupled with its absence on 6 other fibers—indicates that silicon is not a component of AMS polypropylene. *See* Ex. C, Talley at Supp. 3 (Tables S1-S3).

[11] Similarly, Dr. Guelcher could not explain at deposition why the authors found chlorine on one scraped fiber, but not on any of the other 14 fibers. Ex. D, Guelcher 8/17/17 Dep. 50:13-19.

claimed that the authors used "standard methods" in their XPS analysis. *Id.* at 79:1-25. But he could not identify a single step the authors took to confirm the absence of contamination. *Id.*[12]

The presence of silicon may have impacted their analysis in other ways. Silicone contamination would artificially inflate the relative percentage of oxygen the authors detected. All forms of silicone are composed of chains of alternating silicon and oxygen atoms, meaning they contain at least as many oxygen atoms as silicon atoms. *See* Ex. U, W. Roff, et al., "Silicones," *in* Fibres, Films, Plastics and Rubbers, at 458-59 (1971). Thus, residual silicone on the authors' equipment would have exaggerated their oxygen readings.

The failure to rule out contamination proves the methodology is flawed.

B. The scientific literature on which Guelcher relies does not support his degradation opinions because it is either not about Prolene or concerns sutures whose degradation, if any, has not been shown to cause clinical harm.

Stripped of his unreliable testing, Guelcher has no evidence that Prolene is subject to oxidative degradation because the scientific literature does not support his opinions. The Court should exclude his degradation opinions for this reason. *See, e.g.*, *Abarca v. Franklin County Water Dist.*, 761 F. Supp. 2d 1007, 1066 n.60 (E.D. Cal. 2011) ("[A] reliable expert would not ignore contrary data, misstate the findings of others, make sweeping statements without support, and cite papers that do not provide the support asserted.").

Guelcher's own testimony demonstrates that many of his opinions are not supported by scientific literature. Indeed, Guelcher has admitted that:

- He cannot identify any peer-reviewed study suggesting that Prolene loses its antioxidant package such that it oxidizes and degrades. Ex. E, *Huskey* 8/25/14 Trial Tr. 178:6-11.

[12] Dr. Guelcher also claimed that the authors had "no evidence to suggest there was contamination" in their test. *Id.* at 79:1-25. Dr. Guelcher's curious assertion is belied by both the presence of silicon in their test results, and his own testimony that the authors believed it to be "something from the manufacturing process[.]" *See id.* at 48:23-49:6.

- He cannot identify any study showing that chain scission—a prerequisite for degradation—occurs *in vivo* in Prolene. *See* Ex. F, Guelcher 3/23/16 Dep. 66:11-17.

- There is no scientific evidence that Ethicon mesh products become embrittled; rather, it is merely something he "believe[s]." *See id.* at 72:11-73:23; *see also id.* at 75:1-11 (admitting that he is unaware of any evidence that Ethicon mesh products have become embrittled and that he has never measured any such embrittlement).

- "[N]o one has shown—published that [Ethicon mesh products] lose molecular weight" *in vivo*. *Id.* at 75:12-18.

- He is unaware of any study or data confirming that Ethicon mesh products degrade such that their intended function is compromised. *Id.* at 104:22-105:7.

- Even where Guelcher cites to scientific literature, scrutiny of the articles reveals that they do not actually support his opinions. For example, although Guelcher has conceded that Prolene is different than other forms of polypropylene, (*e.g.*, Ex. F, Guelcher 3/23/16 Dep. 87:23-88:9), the majority of the articles on which he relies do not actually analyze Prolene. *See, e.g.*, Ex. B, Report (citing Imel, Wood, Costello, Fayolle, Liebert, etc.).

The few articles that actually address Prolene still do not support the proposition that Prolene is subject to oxidation or degradation in the human body. For example:

- Guelcher relies on a 2015 study by Moalli to show that Ethicon mesh products elicit a foreign body reaction *in vivo*. *See* Ex. V, P. Moalli, "Characterization of the host inflammatory response following implantation of prolapse mesh in rhesus macaque," 213(5) Am. J. Obstet. Gynecol. 668.e1-668e10 (Nov. 2015). Although this study incorporated Prolene mesh in its data set, Guelcher admitted that it made no findings as to oxidation, much less degradation. *See* Ex. F, Guelcher 3/23/16 Dep. 59:10-19.

- Guelcher relies on a 2010 paper by Clave to support his opinion that Prolene is subject to oxidative degradation. *See* Ex. B, Report at 13, 22; Ex. W, A. Clave, "Polypropylene as a reinforcement in pelvic surgery is not inert: comparative analysis of 100 explants," 21 Int. Urogynecol. J. 261, 266 (2010). But Guelcher admitted that Clave's paper expressly states that while there are many "hypotheses concerning the degradation of the PP . . . [n]one of these, particularly direct oxidation, could be confirmed in this study." Ex. E, *Huskey* 8/25/14 Trial Tr. 184:11-185:12. In addition, the Clave paper analyzed 100 meshes from multiple manufacturers, and there is no indication that any of its degradation findings applied to Prolene.

The "goal of the *Daubert* analysis is to ensure that 'an expert, whether basing his testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.'" *Marsh*

v. W.R. Grace & Co., 80 F. App'x 883, 886 (4th Cir. 2003) (citation omitted). Offering an opinion based solely on papers that do not address the subject matter of the opinion—here, Prolene—is inconsistent with the "intellectual rigor" employed by biomedical engineers, particularly given that Guelcher has tried and failed to conduct his own reliable tests.

Guelcher also seeks to support his opinion that Prolene is subject to degradation and embrittlement by pointing to Ethicon's 1987 Prolene suture test, (Ex. X, ETH.MESH.12831391-392), and its seven-year dog study of Prolene sutures, (Ex. Y, ETH.MESH.07690752-756).

Guelcher cannot rely on the 1987 suture test because it did not report a change in the molecular weight of the sutures, which even Plaintiffs' experts have admitted is a fundamental component of oxidative degradation. *See* Ex. Z, Jordi 10/30/13 Dep. 173:25-174:8; Ex. G, Mays 3/2/16 Dep. 79:3-80:12. Nor did the test report that the sutures' mechanical properties—such as elongation and tensile strength—diminished.

Guelcher's reliance on the seven-year dog study is similarly misplaced. Indeed, Guelcher admitted at trial that the study contains no evidence of embrittlement, loss of mechanical properties, or loss of molecular weight. *See* Ex. E, *Huskey* 8/25/2014 Trial Tr. 180:3-183:14. In other words, the study simply does not stand for the proposition that Prolene is subject to degradation in the human body.

III. Guelcher is Not Qualified to Opine that Degradation Causes Complications *In Vivo*, and His Opinions Regarding Complications are Unreliable.

Guelcher seeks to opine that degradation causes "adverse events like pain, scarring and inflammation." *See* Ex. B, Report at 18-22. But he is not a medical doctor, Ex. I, Guelcher 12/18/14 Dep. 18:23-19:5, and has never conducted the differential diagnoses necessary to determine if mesh caused any clinical symptoms, *id.* at 253:1-12; 253:20-254:5. He concedes

that he lacks the data to correlate any complication to degradation. Ex. AA, *Cardenas* 8/18/14 Trial Tr. 518:13-24.

The Court ruled previously that Guelcher cannot offer opinions regarding any complications allegedly caused by degradation. *See* Ex. BB, 8/31/16 Guelcher Wave 1 *Daubert* Order, at 6. The Court's ruling on this Motion should be no different.

IV. Guelcher's Opinions Regarding Alternative Designs Are Unreliable.

A. Guelcher's proposed alternative procedures are not designs.

Guelcher's alternative design opinions are alternative *treatment options* and not feasible, safer alternative *designs* to Ethicon mesh products. *See* Ex. B, Report at 25-28. The issue of alternative design with respect to pelvic mesh products "must be examined in the context of products—not surgeries or procedures." Mem. Op. and Order, *Mullins v. Johnson & Johnson*, 2:12-cv-02952, at 3 (S.D. W. Va. Feb. 23, 2017) [ECF 1881] ("*Mullins* Order"). *Id.* at 4. The Burch and needle suspension procedures are not alternative designs. *Mullins* Order at 4-5.

Likewise, autografts, allografts, and xenografts cannot be considered alternative designs. An autograft is not even a medical device; it is a graft fashioned by the surgeon from the patient's own harvested tissue. Further, none of the biological grafts utilize any type of mesh or synthetic material, and each is implanted and functions differently than Ethicon mesh products.

For these reasons, none of Guelcher's proposed alternatives are alternative designs and should be excluded. *See Mullins* Order, at 3-5; *Schmidt v. C.R. Bard, Inc.*, 2013 U.S. Dist. LEXIS 101963, at *6 (D. Nev. July 22, 2013); *Michael v. Wyeth, LLC*, No. 2:04-cv-0435, 2011 WL 2150112 at *11 (S.D. W. Va. 2011).

B. Guelcher's alternative design opinions are unreliable.

An expert's alternative-design opinion must be excluded under *Daubert* if the expert failed to establish, using reliable testing or scientific literature, that the alternative design is actually safer and at least as effective as the product at issue. *Nease*, 848 F.3d at 234. Guelcher has made no such showing.

First, he has not tested any of the alternative procedures and materials he proposes. *See* Ex. B, Report at 25-28. Second, none of the literature to which he cites actually establishes that his proposed alternatives are safer and as effective as Ethicon mesh products. *See id.* Guelcher's alternative-design opinions are unreliable because he failed to "acknowledge or account for" the significant volume of medical literature demonstrating that Ethicon's mesh devices are as safe—or safer—than his proposed alternatives.[13] Similarly, his opinion that non-mesh alternatives are safer because they eliminate the risk of "mesh-related complications" (*i.e.*, mesh exposure) is unreliable because it is widely reported in the medical literature that exposure and wound complications are not complications unique to mesh.[14]

[13] *See, e.g.*, Ex. CC, A. Woodruff, et al., "Histological comparison of pubovaginal sling graft materials: a comparative study," 72 Urology 85-89 (2008) (histologic comparison various grafts finding (i) autologous and cadaveric fascia explants had the "most demonstrable graft degradation"; (ii) xenografts were all "severely encapsulated," (iii) "cadaveric tissues demonstrated the most degradation of all harvested materials, as well as mild to moderate encapsulation"; and (iv) polypropylene mesh explants "displayed no evidence of degradation or encapsulation[.]"); Ex. DD, M. Albo, et al., "Burch colposuspension versus fascial sling to reduce urinary stress incontinence," 356 N. Eng. J. Med. 2143-55 (2007) (comparing outcomes from autologous slings to Burch procedure, and reporting overall incidence of "serious adverse events" as 13% in the autologous sling group and 10% in the Burch group, while non-serious adverse events were reported as 63% and 47%, respectively).

[14] *See, e.g.*, Ex. EE, A. Sokol, et al., "One-year objective and functional outcomes of a randomized clinical trial of vaginal mesh for prolapse," 206 Am. J. Obstet. Gynecol. 86.e1-9 (2012) (randomized controlled trial comparing outcomes in patients undergoing surgical prolapse repairs with mesh versus non-mesh repairs utilizing sutures, and reporting 15.6% rate of mesh exposure against 15% rate of suture exposure); Ex. FF, H. Abed, et al., "Incidence and management of graft erosion, wound granulation, and dyspareunia following vaginal prolapse repair with graft materials: a systematic review," Int. Urogynecol. J. (2011) (systemic review of 110 studies addressing incidence of synthetic and biological graft erosions in prolapse repairs, and finding rate of erosion was 10.3% in the synthetic grafts and 10.1% in the biological grafts).

Finally, the medical literature demonstrates that Guelcher's proposed alternatives do not offer greater efficacy rates than Ethicon mesh products. For example, the literature shows that synthetic slings, such as TVT and TVT-O, provide superior long-term efficacy compared to the Burch procedure and pubovaginal slings constructed with allografts and autografts.[15]

V. Guelcher's Opinions Concerning Ethicon's Purported Knowledge, State of Mind, and Corporate Conduct Do Not Assist the Trier of Fact.

Throughout his report, Guelcher opines as to Ethicon's alleged knowledge regarding a variety of topics. *See, e.g.*, Ex. B, Report at 3, 16, 18-19, 21, 24-25, 28. In support of these opinions, he spends several pages presenting his interpretation of a series of Ethicon's internal documents. *See id.* at 14-18, 21. This Court has repeatedly held that a corporate defendant's "knowledge, state of mind, alleged bad acts, failures to act, or other matters related to corporate conduct and ethics are not appropriate subjects of expert testimony because opinions on these matters will not assist the jury." *In re C.R. Bard, Inc.*, 948 F. Supp. 2d 589, 611 (S.D. W. Va. 2013).[16] The result here should be no different.

CONCLUSION

For these reasons, Ethicon respectfully requests that the Court grant its Motion to Exclude the Opinions and Testimony of Dr. Scott Guelcher.

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[15] *Compare* Ex. GG, C. Nilsson, *et al.*, "Long-term Follow-up of the TVT operation: 17 year results," 24 Int. Urogynecol. J. Supp. S1-152, 107 (2013) (reporting 17-year data for women treated with TVT, and showing 93% objective cure rate) *and* Ex. HH, R. Svenningsen, *et al*, "Long-term follow-up of the retropubic tension-free vaginal tape procedure," Int. Urogynecol J. (2013) (reporting 89.9% objective cure rate for 10-year follow up on 483 patients treated with TVT) *with* Ex. DD, Albo (reporting cure rate of 66% for patients treated with autologous slings, and 49% for patients treated with Burch procedure) *and* Ex. II, P. Kjolhede, "Long-term efficacy of Burch colposuspension: a 14-year follow-up study," 84 Acta Obstet. Gynecol. Scand. 767-72 (2005) (reporting that 14 years after Burch procedure, 19% of patients remained completely dry, and 56% demonstrated significant SUI).

[16] Dr. Guelcher is also unqualified to opine as to Ethicon's corporate knowledge and conduct. He is a chemical engineer, and has no knowledge or experience as to the manner in which corporations act or think in marketing medical devices. *See In re Diet Drugs Prods. Liab. Litig.*, 2000 WL 876900, at *9 (E.D. Pa. June 20, 2000).

Respectfully submitted,

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IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
AT CHARLESTON

IN RE ETHICON, INC., PELVIC REPAIR SYSTEM PRODUCTS LIABILITY LITIGATION	**Master File No. 2:12-MD-02327** **MDL 2327**
THIS DOCUMENT RELATES TO: **WAVE 5 CASES**	**JOSEPH R. GOODWIN** **U.S. DISTRICT JUDGE**

CERTIFICATE OF SERVICE

I hereby certify that on August 31, 2017, I electronically filed the foregoing document with the Clerk of the Court using the CM/ECF system which will send notification of such filing to CM/ECF participants registered to receive service in this MDL.

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